Space Weather Forecast

Issued on Sunday, 12 June 2022 at 01:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight but increasing chance of moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity was Low in the last 24 hours, with two minor Common-class flares that originated from near the northeastern limb. There are currently two sunspots on the visible disc, one of which is large with some magnetic complexity and was linked to a Moderate-class flare on 10 June.
No Earth directed Coronal Mass Ejections (CMEs) were observed in available imagery, with yesterday's CME being assessed as missing ahead of Earth's orbit.

Solar Wind / Geomagnetic Activity: The solar wind has been at mostly background levels during the last 24 hours, but with some signs of weak coronal hole influences. Wind speeds were slow, increasing slightly from 300 km/s, to around 370 km/s. Interplanetary magnetic field strength has been weak with brief moderate peaks. The north-south component has varied weakly. Geomagnetic activity was Quiet (Kp 1-2) with an Unsettled (Kp 3) interval between 11/0600-0900 UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were detected.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be mainly Low through this period, with Common-class flares likely and a slight chance of Moderate-class flares. However some bright flux can be observed in satellite imagery, suggesting further sunspot regions may rotate onto the disc in the near future, with a slight increase in associated flare probabilities.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs were observed in available satellite imagery. Solar winds are expected to be mainly at background levels initially, with some enhancements possible, due to small and transient coronal holes. An increase near to 500 km/s was observed at the STEREO-A spacecraft, which may reach Earth during Day 1 (12 June). A further coronal hole is then likely to give another enhancement later Day 3 or on Day 4 (14-15 June). However, geomagnetic response from coronal hole fast winds is usually muted near the solstice. As such, geomagnetic activity is expected to be mainly Quiet to Unsettled, with a chance of Active intervals, especially on Days 1 and 4.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, although there is a very slight increase in the chance of S1 as the larger sunspot region moves across the disc to a position where proton events are more likely to reach Earth.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	25	30	30
Very Active	R3 to R5 X	No	2	3	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	2	3
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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